CLAIMS

1. A diagnostic method for detecting in at least one biological sample an antibody that binds to at least one epitope of a SARS virus, comprising:

(a) contacting said at least one biological sample with

at least one isolated SARS virus protein, or

at least one fragment of said isolated SARS virus protein comprising at least one epitope of the SARS virus, and

(b) detecting the formation of an antigen-antibody complex between said virus protein or said fragment and an antibody present in said biological sample.

2. The method of claim 1, wherein said at least one isolated SARS virus protein is an N or S protein.

3. The method of claim 2, wherein said at least one fragment

(a) is N195 or Fc of SIN 2774;

(b) corresponds substantially to N195 or Fc of SIN 2774;

or a mixture thereof.

4. The method of claim 1, wherein said at least one isolated SARS virus protein or fragment thereof is a recombinant expression product.

5. An in vitro diagnostic kit for detecting in a biological sample an antibody against a SARS virus comprising:

(a) at least one isolated SARS virus protein, or

at least one fragment of said isolated SARS virus protein comprising at least one epitope of the SARS virus, and

(b) reagents for detecting the formation of antigen-antibody complex between said at least one isolated SARS virus protein or a fragment thereof and at least one

antibody present in said biological sample,

wherein said at least one isolated protein or fragment thereof and said reagents are present in an amount sufficient to detect the formation of said antigen-antibody complex.

6. The kit of claim 5, wherein wherein said at least one fragment

(a) is N195 or Fc of SIN 2774;

(b) corresponds substantially to N195 or Fc of SIN 2774;

or a mixture thereof.

7. A method for determining an epitope specific for the SARS virus comprising:

(a) providing at least one fragment of at least one protein of the SARS virus, wherein said at least one fragment is at least 65 amino acids long,

(b) reacting said at least one fragment with

(1) at least one serum sample from at least one SARS positive human, and

(2) at least one serum sample from a coronavirus positive, SARS negative, human or non-human animal,

(c) detecting fragment-antibody complexes formed from the reactions of (b) (1) and (b) (2); and

(d) selecting one or more fragments comprising epitopes specific for the SARS virus by selecting fragments that form fragment-antibody complexes as a result of the reaction of step (b) (1), but not as a result of the reaction of step (b) (2).

8. The method of claim 7, wherein said fragment is reacted with sera from at least 5 SARS positive humans.

9. The method of claim 7, wherein said serum sample in (b)(2) is chicken serum against IBV or pig serum against TGE.

10. A diagnostic method for detecting the presence in at least one biological sample

of at least one antibody against a SARS virus, comprising:

(a) contacting said at least one biological sample with

one or more peptides comprising at least about 65 contiguous amino acid residues of SEQ ID No. 2, or

one or more peptides comprising at least about 65 amino acid residues and having at least about 90% sequence identity with a contiguous number of amino acid residues of SEQ ID No. 2 having about equal length as said one or more peptides, wherein said one or more peptides comprise at least one epitope of a SARS virus, and

(b) detecting whether an antigen-antibody complex has formed between said one or more peptides and antibodies present in said biological sample.

11. A diagnostic method for detecting the presence in at least one biological sample of an antibody against a SARS virus, comprising:

(a) contacting said at least one biological sample with

one or more peptides comprising at least about 65 contiguous amino acid residues of SEQ ID No. 4, or

one or more peptides comprising at least about 65 amino acid residues and having at least about 90% sequence identity with a contiguous number of amino acid residues of SEQ ID No. 4 having about equal length as said one or more peptides, wherein said one or more peptides comprise at least one epitope of a SARS virus, and

(b) detecting whether an antigen-antibody complex has formed between said one or more peptides and antibodies present in said biological sample.

12. The diagnostic method of claim 10, wherein said one or more peptides have at least about 95% sequence identity with a contiguous number of amino acid residues of SEQ ID No. 6 having about equal length as said one or more peptides.

13. The diagnostic method of claim 11, wherein said one or more peptides have at least about 95% sequence identity with a contiguous number of amino acid residues

of SEQ ID No. 8 having about equal length as said one or more peptides.

14. An isolated and purified nucleic acid comprising

at least one polynucleotide comprising at least about 195 contiguous nucleotides of SEQ ID No. 1, or

at least one polynucleotide comprising at least about 195 contiguous nucleotides which have at least about 75% homology with a contiguous number of nucleotides of SEQ ID No. 1 having about equal length as said at least one polynucleotide, wherein said polynucleotide encodes a peptide that is adapted to detect anti-SARS antibody in a sample.

15. An isolated and purified nucleic acid comprising

at least one polynucleotide comprising at least about 195 contiguous nucleotides of SEQ ID No. 3, or

at least one polynucleotide comprising at least about 195 contiguous nucleotides which have at least about 75% homology with a contiguous number of nucleotides of SEQ ID No. 3 having about equal length as said at least one polynucleotide, wherein said polynucleotide encodes a peptide that is adapted to detect anti-SARS antibody in a sample.

16. An isolated and purified nucleic acid according to claim 14, wherein said polynucleotide hybridizes under stringent conditions with a contiguous number of nucleotides of SEQ ID No. 5 having about equal length as said at least one polynucleotide.

17. An isolated and purified nucleic acid according to claim 15, wherein said polynucleotide hybridizes under stringent conditions with a contiguous number of nucleotides of SEQ ID No. 7 having about equal length as said at least one polynucleotide.

18. The diagnostic method of claims 1, 10 or 11, wherein the formation of antigen-

antibody complex is detected by radioimmunoassay (RIA),enzyme linked immunosorbent assay (ELISA), immunofluorescence assay (IFA), dot blot or western blot.

19. The diagnostic method of claims 1, 10 or 11, wherein the formation of antigen-antibody complex is detected by western blot and said at least one fragment or peptide is adapted to detect IgG at a dilution of about 1:800.

20. The diagnostic method of claims 1, 10 or 11, wherein the formation of antigen-antibody complex is detected by western blot and said at least one fragment or peptide is adapted to detect IgM at a dilution of about 1:100.

21. The diagnostic method of claims 1, 10 or 11, wherein the formation of antigen-antibody complex is detected by western blot and said at least one fragment or peptide has a sensitivity of more than about 85%.

22. The diagnostic method of claims 1, 10 or 11, wherein the formation of antigen-antibody complex is detected by western blot and said at least one fragment or peptide has a specificity of more than about 85%.

23. The diagnostic method of claims 1, 10 or 11, wherein the formation of antigen-antibody complex is detected by western blot and said at least one fragment or peptide has an overall detection rate for a clinical sample of more than 65%.

24. The diagnostic method of claims 1, 10 or 11, wherein said biological sample is contacted with at least two fragments of said at least one isolated SARS protein.

25. The diagnostic method of claim 24, wherein said at least two fragments are derived from at least two distinct isolated SARS proteins.

26. The diagnostic method of claim 24, wherein said at least two fragments form a

fusion protein.

27. The diagnostic method of claim 24, wherein said at least two fragments are Fc and N195.

28. The diagnostic method of claim 26, wherein said fusion protein comprises Fc at its N terminus and N195 at its C terminus.

29. The diagnostic method of claim 26, wherein said fusion protein comprises N195 at its N terminus and Fc at its C terminus.

30. A method for producing a monoclonal antibody against at least one SARS protein comprising:

(a) injecting at least one antigenic fragment of said protein into a non-human animal,

(b) isolating at least one spleen cell from said non-human animal,

(c) fusing said at least one spleen cell with a myeloma cell,

(d) screening the resulting hybridoma cells with said at least one SARS protein for the production of monoclonal antibody against said at least one SARS protein, and

(e) selecting at least one hybridoma cell producing said monoclonal antibody.

31. The method of claim 30, wherein said at least one SARS protein is an S protein and said fragment is Fc.

32. The method of claim 30, wherein said at least one SARS protein is an N protein and said fragment is N195.

33. A diagnostic method for detecting a SARS virus in at least one biological sample, comprising:

(a) contacting said at least one biological sample with at least one monoclonal antibody against a SARS virus protein, and

(b) detecting the formation of a complex between said monoclonal antibody and said SARS virus.

34. The diagnostic method of claim 33, wherein said monoclonal antibody is derived from a non-human animal injected with an antigenic fragment of a SARS virus protein.

35. The diagnostic method of claim 33, wherein said monoclonal antibody is derived from a non-human animal injected with

an antigenic peptide comprising at least about 65 contiguous amino acid residues of SEQ ID No. 2, or

an antigenic peptide comprising at least about 65 amino acid residues and having at least about 90% sequence identity with a contiguous number of amino acid residues of SEQ ID No. 2 having about equal length as said antigenic peptide.

36. The diagnostic method of claim 33, wherein said at least one monoclonal antibody is derived from a non-human animal injected with

an antigenic peptide comprising at least about 65 contiguous amino acid residues of SEQ ID No. 4, or

an antigenic peptide comprising at least about 65 amino acid residues and having at least about 90% sequence identity with a contiguous number of amino acid residues of SEQ ID No. 4 having about equal length as said antigenic peptide.

37. The method of claim 33, wherein said antigenic fragment is a fragment of an N or S protein of the SARS virus.

38. The method of claim 37, wherein said antigenic fragment is N195 or Fc.

39. A monoclonal antibody against at least one epitope of a protein of SARS, wherein said at least one epitope is on at least one antigenic fragment of a SARS protein

40. The monoclonal antibody of claim 39, wherein said antigenic fragment is the N195 fragment of the N protein of SARS.

41. The monoclonal antibody of claim 39, wherein said antigenic fragment is the Fc fragment of the S protein of SARS.

42. A recombinant antibody fragment, wherein said recombinant antibody fragment is derived from the monoclonal antibody of claim 39.